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Analysis of Defense Products Contract Trends, 1990– 2014

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Analysis of Defense Products Contract Trends, 1990–2014

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Abstract

Existing research on defense products contracting shows a marked focus on large and high-profile programs that qualify as Major Defense Acquisition Programs (MDAPs). In an effort to fill a gap in the literature of product contracting, CSIS has launched this study—an analysis of trends in DoD products contracting covering all contracting types, key components accounts, and categories of products.

Looking at the period from 1990–2014, this report presents initial results and focuses on three notable questions: How have rates of effective competition differed between different categories of products throughout the period? How have the industrial bases for different categories of products changed since 1990? And how did sequestration and its aftermath affect DoD products contracting? Additionally, this report identifies notable data quality issues with both the Federal Procurement Data System and DD350 data to aid future research.

The main findings of this initial inquiry are threefold: first, that “Last Supper” industry consolidation has affected the vendor size mix and levels of competition in the defense products industrial base to this day; second, that sequestration has had profound effects on what products the DoD buys; and third, that contracting trends vary significantly for the various DoD components and categories of products.



Introduction¹

For almost a decade, the Defense-Industrial Initiatives Group at the Center for Strategic and International Studies (CSIS) has analyzed and reported on trends in federal contracting in general, and Department of Defense (DoD) contracting specifically. While initially focused on services contracting as well as the overall trends of DoD contracting, CSIS has in recent years sought to drill down deeper into this data with regard to the DoD's key components, and for the different varieties of goods and services that the DoD contracts for. Past CSIS work for the Naval Postgraduate School has focused on trends in DoD services contracting; in this report, the study team shifts its focus to DoD products contracting.

The existing literature on defense products contracting tends to focus on large, high-profile and high-cost programs that qualify as Major Defense Acquisition Programs (MDAPs). This focus, however, does not capture the full range of products that the DoD contracts for. In an effort to fill a gap in the literature, CSIS has undertaken a comprehensive analysis of trends in DoD products contracting for the DoD and its key components: the Army, Navy, Air Force, Defense Logistics Agency (DLA), and "Other DoD," which comprises all remaining contracting entities not captured by the first four categories.

In order to facilitate analysis of the differences in contracting trends between different types of products, CSIS has created a taxonomy of the universe of DoD products², using U.S. government Product and Service Codes (PSCs) to separate DoD products into 10 product categories: Aircraft, Clothing & Subsistence, Electronics & Communications, Engines & Power Plants, Fuels, Ground Vehicles, Launchers & Munitions, Missiles & Space, Ships, and "Other."³

This report presents interim findings from this analysis. Though the overall research effort will delve deeply into the product categories that are not typically associated with MDAPs, this initial paper will focus primarily (but not exclusively) on the more prominent product categories, as the study team attempts to validate the overall research methodology and better understand the particular issues involved with the less prominent categories of defense products.

This paper focuses on three areas related to both historical and recent trends in defense products:

¹ The Center for Strategic and International Studies (CSIS) does not take specific policy positions; accordingly, all views expressed in this presentation should be understood to be solely those of the author(s).

² Though the CSIS DoD products taxonomy does not necessarily align with the taxonomy developed within the DoD, CSIS does have the capability to cross-walk between the two.

³ The five product categories that are not mostly comprised of platforms and programs related to MDAPs (Clothing & Subsistence, Electronics & Communications, Fuels, Launchers & Munitions, and "Other") accounted for 42% of DoD products contracts in 2014, though those categories do include some MDAPs. Using the FPDS *system equipment code* field, over 60% of contract obligations are not associated with an MDAP in 2014, but that field is not filled in consistently. Though neither of these methods can provide a precise figure for the share of products contract obligations associated with MDAPs, it is safe to say that a significant share of defense products contract obligations, perhaps as much as half, are not associated with MDAPs.



- Historical trends in competition for DoD products
- Changes in the industrial base for DoD products
- The impact of sequestration and its aftermath on DoD products contracting overall, by component, and by product category

Methodology

To provide greater historical context to recent trends, CSIS has integrated fiscal year (FY)1990–1999 contracting data into its analysis for this study. All data from FY2000–2014 is drawn from the publicly-available Federal Procurement Data System (FPDS) through the USASpending.gov portal. Due to a lack of pre-2000 data available through USASpending.gov and how unwieldy it is to get the full range of relevant study variables for the entire department using the FPDS.gov web tool, CSIS is using archival DD350 data for the 1990–1999 period.⁴ The adoption of archival DD350 data for the period 1990–1999 poses challenges of which we are aware and have worked diligently to mitigate and standardize.

This report relies on the methodology that the study team has established and refined for analysis of federal contracting data over the course of the last decade.⁵ For this study in particular, there are a few key differences and updates:

- All dollar figures are in constant 2014 dollars, using the latest OMB deflators.
- In FY2013, the Defense Commissary Agency (DeCA) stopped reporting most of its contract obligations (approximately \$5 billion) into FPDS. Because this creates a significant data discrepancy that distorts trend analysis, CSIS has excluded DeCA from the data set throughout the period.
- For analysis of the industrial base, the composition of the “Big 6” defense vendors has changed—BAE Systems, which has declined as a DoD vendor in recent years, has been replaced by United Technologies for all years in the data set.

Notable Limitations and Gaps in Pre-2000 Contract Data

Use of archival DD350 data for the 1990–1999 period carries some cost in data quality, as there are notable differences in coding schema and granularity between the DD350s and the modern FPDS architecture. The following are the most notable issues:

- DD350 data for FY1990–FY1999 reflect pre-FY2004 reporting thresholds, which did not require the DoD to report more than summary information on contracts below \$25,000.
- FY1990 has a significant percentage of data left blank or otherwise unclassifiable, mostly in the fields used for competition, pricing mechanism, and vehicle.

⁴ Past CSIS work has at times included 1990–1999 data extracted from the FPDS.gov web tool, but that approach did not allow for examining vendor size or examining more than one variable at a time.

⁵ See <http://csis.org/program/methodology> for the complete methodology.



- FY1994 data had a serious data issue wherein nearly all Army contracts were improperly classified under other components. CSIS has been able to partially correct this issue, and is continuing to seek a full solution, but Army contract obligations for 1994 remain understated.
- The DD350 does not include the “Statutory Exemption to Fair Opportunity” field, which CSIS uses for greater precision on levels of competition for Indefinite Delivery Vehicle (IDV) contracts.
- Prior to FY1997, DD350 data did not reliably differentiate between numbers of offers greater than two (such that most contracts receiving two or more offers had “2” listed under number of offers). As such, pre-1997 competition data has reduced granularity in terms of number of offers.

Attempts to use data from FPDS.gov to address these issues have been hampered by a more serious data gap: For 1990–1994, the total DoD contract obligations in FPDS are approximately \$20 billion per year lower than in the data contained in the DD350s, representing about a sixth of total DoD contract obligations for those years. Upon further investigation, the study team found that a number of large contracts in the DD350 data set are either completely missing from FPDS or have vastly lower obligation levels associated with them. CSIS is currently engaged with policy makers inside the DoD to raise awareness of this issue, identify the source of the data gap, and work toward a solution.

Though these are serious data quality issues, the CSIS nonetheless believes the overall quality and reliability of the data set is more than sufficient to perform meaningful trend analysis.

Historical Trends

Competition for Defense Products

In a recent short paper, the study team noted that competition rates for products, services, and R&D for the DoD overall were remarkably consistent from 2008–2014 (Ellman, 2014). During that period, around one-third of contract obligations were awarded after effective competition.⁶ With the integration of pre-2000 data into the CSIS federal contracting database, the study team can now extend this analysis back to 1991.⁷ This historical data gives us new insight into the Post–Cold War drawdown, a period that gives important context to the present drawdown. This comparison is particularly valuable because it can help illuminate the effects of sequestration, which was not a factor in the 1990s.

From 1991 to 1998, the rate of effective competition for DoD products contracts fluctuated between 38% and 42% in all but one year (36% in 1995). The data shows a slow but steady decline in effective competition rates after 1996, which coincides with the Last Supper industry consolidation that removed a number of major competitors from the defense market via mergers and acquisitions.

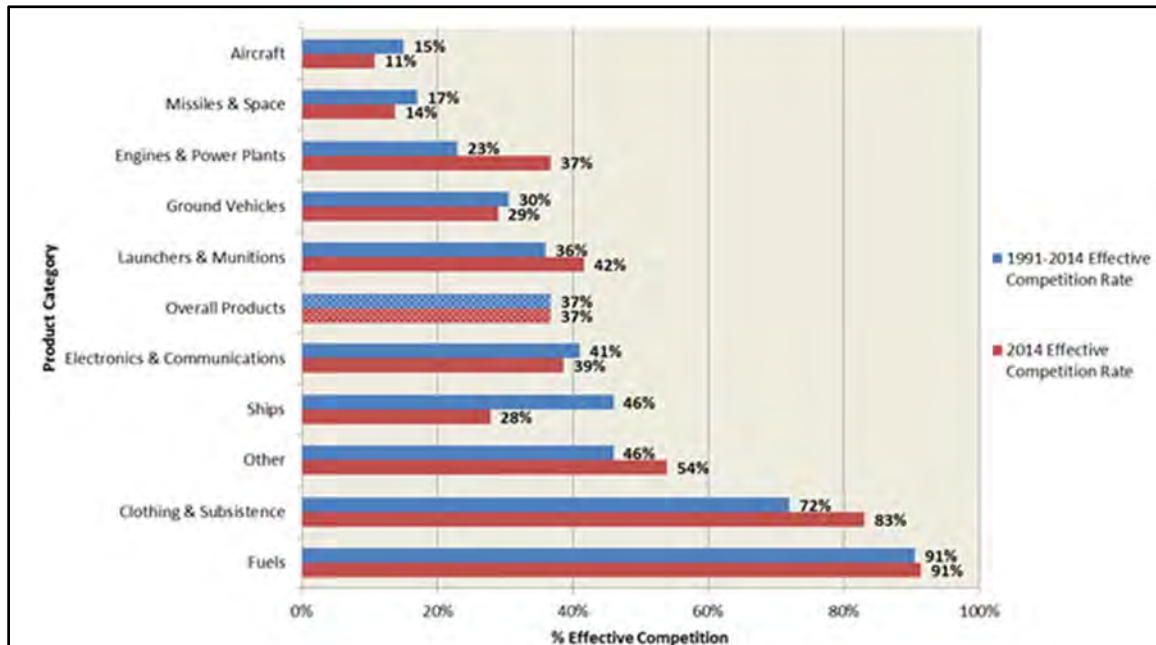
⁶ CSIS defines *effective competition* as a competitively solicited award that received two or more offers, which is similar to the DoD’s definition of effective competition.

⁷ Data from 1990 are excluded here because nearly 36% of obligations in that year are “unlabeled” for competition.



The rate of effective competition fell from 40% in 1996 to 33% in 2004, before surging to 40% in 2005. From 2007 on, effective competition rates hovered between 33% and 37%.

The rate of effective competition for overall DoD products does not tell the whole story because there are significant differences between the different product categories. Figure 1 puts these differences into context by comparing 2014 competition rates for each product category to their overall average competition rate from 1991–2014.



Note. Data in this figure comes from the FPDS, CSIS analysis.

Figure 1. 1991–2014 Effective Competition Rates vs. 2014 Effective Competition Rates for Defense Products by Product Category

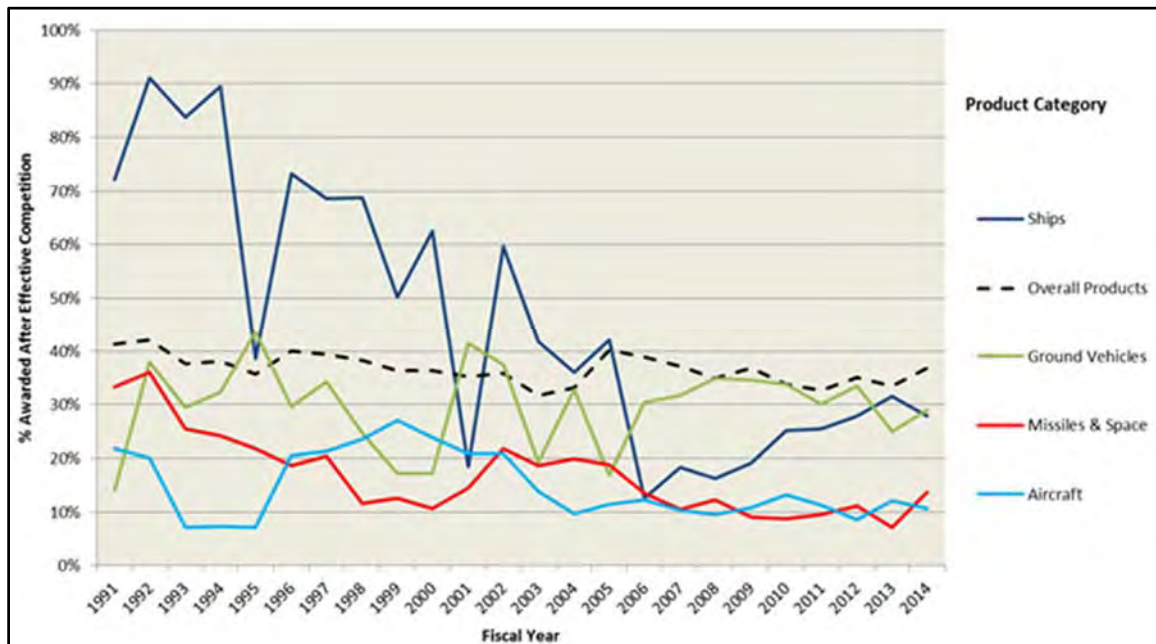
For overall DoD products, the 2014 effective competition rate is right in line with the rate of effective competition for the entire period, reinforcing the point that the rate of competition for products has been overall quite stable over time. For Aircraft, Missiles & Space (M&S), Ground Vehicles, Electronics & Communications (E&C), and Fuels, the 2014 rates of competition are within a few percentage points of their historical averages. Rates of effective competition in 2014 for Engines & Power Plants (E&PP), Launchers & Munitions (L&M), Clothing & Subsistence (C&S), and “Other” are notably above their historical averages, while the effective competition rate for Ships is well below the historical average.

However, historical averages can only provide so much visibility into trends, and effective competition rates within product categories have been quite volatile from year to year; given the relatively “small” size of the various products categories, it is unsurprising that one or two big contracts (or a group of smaller ones) can cause big shifts in effective competition rates. Still, looking at effective competition rates over the period in question can provide greater insight into long-term trends.

Platforms and Complex Systems: Aircraft, Ground Vehicles, Ships, and Missiles & Space

For this analysis, the study team has focused on trends in the rates of effective competition for the four platform-focused product categories: Aircraft, Ground Vehicles,

Ships, and Missiles & Space. Figure 2 shows effective competition rates for those four product categories between 1991 and 2014.⁸



Note. Data in this figure comes from the FPDS, CSIS analysis.

Figure 2. Rate of Effective Competition for Aircraft, Ground Vehicles, Ships, and Missiles & Space, 1991–2014

Aircraft

The effective competition rate for Aircraft has consistently been among the lowest, if not the lowest, among the product categories, owing both to the length and complexity of the programs and the limited number of vendors able to effectively compete at the development stage. Interestingly, even after the Last Supper–inspired flurry of mergers and acquisitions in the mid-1990s radically changed the landscape of the Aircraft industrial base, the rate of effective competition was largely stable in the low-to-mid 20s until 2003, when the rate fell to 14%. One possible explanation for the delayed effect is the amount of time it takes for new major Aircraft programs to start up: Large programs like the F-22 and F-35 were just starting to ramp up in the early 2000s. After 2003, the rate of effective competition for Aircraft has never exceeded 13%, hovering between 10 and 12% in most years, about one-third the rate for overall DoD products.

Missiles & Space

Similar to Aircraft, the consistently low rates of effective competition for M&S are reflective of highly complex programs with a limited industrial base. The rate of effective competition for M&S peaked at 36% in 1992, but dropped off steadily (with a couple of plateaus) afterwards, to a low of 11% in 2000. The rate spiked up briefly to between 19%

⁸ Data for 1990 is excluded due to data quality issues. See the Methodology section for further discussion.

and 22% from 2002–2005, primarily due to increased Air Force contract obligations for “space vehicles,” but has dropped off since, and did not exceed 12% in any year from 2007–2013. In 2014, the rate of effective competition doubled, from 7% in 2013 (the lowest rate in the period) to 14%.

Ground Vehicles

The available industrial base able to compete for most ground vehicle programs is significantly broader than that for the two previous categories, so it is not surprising that the rate of effective competition for ground vehicles has usually been somewhat higher. That rate was extremely volatile in the 1990s, rising as high as 44% in 1995, and then falling back to 17% in 1999 and 2000. That volatility continued into the early 2000s, with effective competition rates rising to 41% in 2001, and then fluctuating between the mid-to-high 30s and the high teens over the next four years. Between 2006 and 2012, however, effective competition rates have hovered in the low-to-mid 30% range, in part as a result of the highly competitive MRAP contracts in the mid-to-late 2000s. The effective competition rate for Ground Vehicles fell from 34% in 2012 to 25% in 2013, but rose back to 29% in 2014.

Ships

Considering the size and complexity of the platforms involved, the high rates of effective competition for Ships in the 1990s—as high as 91% in 1992, and over 60% in all but one year between 1991 and 2000—is somewhat surprising. The private shipyard consolidation in the late 1990s and early 2000s had a major impact on that rate, as the rate of effective competition never exceeded 50% after 2002, only exceeded 30% in one year after 2005, and remained below 20% from 2006 through 2009. Since 2009, however, the rate of effective competition has increased, remaining above 25% in every year and rising to 32% in 2013. This is likely the result of deliberate decisions to split the procurement of certain high-cost platforms, such as the Littoral Combat Ship (LCS) and Aegis-class destroyers, between two competing shipyards.

Changes in the Defense Products Industrial Base, 1990–2014

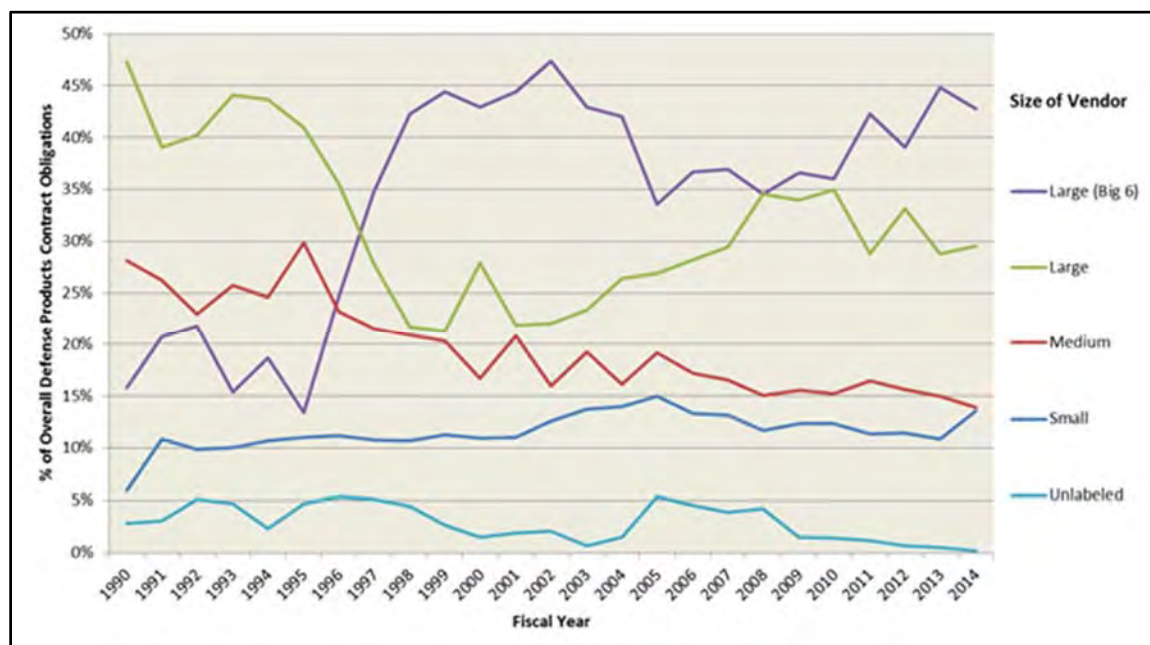
In addition to tracking trends on the customer side of defense contracts, CSIS also tracks trends on the vendor side of the equation. In particular, the study team has built up the capability to track contract obligations by size of vendor. In order to facilitate this analysis, vendors are divided into four size categories: Small, Medium, Large, and the Big 6. Any organization designated as small by the FPDS database—according to the criteria established by the federal government—was categorized as such unless the vendor was a known subsidiary of a larger entity. Vendors with annual revenue of more than \$3 billion, including from nonfederal sources, are classified as large. The Big 6, broken out from “large,” consists of the six largest defense firms in recent years (Boeing, Lockheed Martin, Northrop Grumman, General Dynamics, Raytheon, and United Technologies Corporation⁹).¹⁰ And any contractor that qualifies as neither small nor large is classified as “medium.”

⁹ United Technologies replaces BAE in the Big 6 in this report and going forward because BAE has fallen off in recent years as DoD purchases of ground vehicles have slowed.

¹⁰ While Northrop Grumman, United Technologies, Raytheon, and General Dynamics were all consistently among the top defense products vendors before the Last Supper industry consolidation,



The shares of DoD products contract obligations awarded to each size category (plus the share marked as “Unlabeled” due to data quality issues) are shown in Figure 3.



Note. Data in this figure comes from the FPDS, CSIS analysis.

Figure 3. Share of Defense Products Contract Obligations by Size of Vendor

The share of overall defense products contract obligations awarded to small vendors has been extremely stable throughout the period observed. Small vendors accounted for between 10% and 11% of products contract obligations in every year from 1991–2001, rose steadily to 15% by 2005, and gradually fell back to 11% from 2011–2013. The 14% share awarded to small vendors in 2014 is the highest since 2005.

The share of products contract obligations awarded to medium vendors hovered in the mid-to-high 20s in the early 1990s, peaking at 30% in 1995. That rate sharply declined in 1996, to 23%, and declined steadily for the rest of the decade; this is likely the result of the mergers and acquisitions coming out of the Last Supper. The share awarded to medium vendors never exceeded 19% after 2001, and has hovered in the mid-teens for most of the 2000s and 2010s, falling to an all-time low of 14% in 2014.

Boeing was not consistently in the top echelon of vendors until the merger with McDonnell Douglas (which had consistently been a top products vendor), and “Lockheed Martin” did not exist until the merger of Lockheed and Martin Marietta. For this analysis, both Lockheed and Martin Marietta are classified as “Large” in the years before they merged, rather than as Big 6, and Boeing is considered part of the Big 6 despite being a smaller player in the defense market than McDonnell Douglas before the merger. CSIS will consult with experts in the coming months to get a better understanding of the pre-Last Supper defense industrial base in order to determine if there is a better way to track contract obligations going to the largest defense firms in those years.

The shares of products contract obligations awarded to large and Big 6 vendors showed the biggest changes from the Last Supper industry consolidation of the mid-to-late 1990s. The share awarded to the Big 6 vendors nearly tripled between 1993 and 1999, rising from 15% to 44%; the merged Lockheed Martin accounted for 11% of the overall 1999 DoD products market. Meanwhile, the share awarded to large vendors fell by more than half over the same period, from 44% in 1993 to 21% in 1999. The difference in the magnitude of the changes is explained by the fact that some medium vendors were also involved in the flurry of mergers and acquisitions, shifting some products obligations to the Big 6.

In the 2000s, that trend began to reverse somewhat, with obligations to large vendors rising from 22% in 2001 to 35% in 2008, while the Big 6 share of DoD products contract obligations fell from 44% to 35% over that same period. Since 2008, the trend has shifted again, with the share going to the Big 6 rising steadily (to 43% in 2014), while the share going to large vendors declined to 30% by 2014. This change happened despite the countervailing trend of divestments, including Northrop Grumman's divestment of its shipbuilding business into Huntington Ingalls Industries.

As with the other areas of analysis in this report, looking at overall trends for vendor size does not tell the whole story—the industrial bases serving the different product categories are vastly different. The following sections will look at select product categories that have seen interesting trends within their respective industrial bases.

Aircraft

The effect of the Last Supper industry consolidation was particularly pronounced for Aircraft. In 1995, 68% of contract obligations for Aircraft went to large vendors, while only 21% went to the Big 6. By 1999, large vendors accounted for only 11% of Aircraft contract obligations, while the Big 6 accounted for 79%. Since 1999, over 70% of Aircraft contract obligations have been awarded to the Big 6 in all but two years (66% in 2010, and 69% in 2011).

Clothing & Subsistence

There has been a notable shift in the industrial base for C&S over the 1990–2014 period. In the early-to-mid 1990s, small and medium vendors dominated the C&S market, with small vendors capturing over 40% of C&S contract obligations in most years, and medium vendors accounting for as much as 56%. After 1995, however, large vendors captured increasing shares of C&S contract obligations, rising from 4% in 1995 to 33% in 2002, with the majority of the increase drawn away from medium vendors, which fell to 35% by 2002.

In the years since, the share of C&S obligations awarded to large vendors continued to rise to 50% in 2009, drawing mostly from small vendors, which declined as a share of C&S obligations from 32% in 2002 to 20% in 2009, and have never exceeded 20% since.

Electronics & Communications

The Last Supper industry consolidation had a profound effect on the E&C industrial base, with the share of contract obligations going to the Big 6 rising from 11% in 1993 to 36% in 1999, drawing roughly equally from medium and large vendors, though large vendors recovered some of their share of the E&C market from the Big 6 in the early-to-mid 2000s. The most interesting trend in recent years has been the consistent growth in E&C contract obligations to small vendors: From 17% in 1999, the share awarded to small vendors has grown steadily through the intervening years, to a high of 29% in 2014, the highest share of any size category and over double the rate for overall defense products.



This growth has apparently come at the expense of the Big 6, which saw its share of E&C contract obligations decline from 36% in 1999 to 24% in 2014.

Launchers & Munitions

As with E&C, the industry consolidation in the wake of the Last Supper led to significant changes in the L&M industrial base. Between 1996 and 1997, L&M contract obligations to the Big 6 rose from 13% in 1996 to 45% in 2007, drawing roughly equally from medium and large vendors. In the mid-2000s, there was a notable surge in contract obligations to small vendors, whose share of L&M contract obligations rose from 9% in 2002 to 20% in 2007. That increase was short lived, however, and the share awarded to small businesses has declined steadily since, back to 9% in 2013 and 2014.

Missiles and Space

As with several other categories, M&S saw a post–Last Supper shift in contract obligations from medium and large vendors to the Big 6. Available data suggests that throughout the 1990–2014 period, the share of M&S contract obligations awarded to small vendors never exceeded 3%, by far the lowest share for small vendors of any product category. Similarly, while medium vendors accounted for shares in the mid-teens to low 20% range from 1990–1995, medium vendors have not been a significant factor in M&S contracting since 1999. Between 2000 and 2014, the share of M&S contract obligations awarded to medium vendors has only exceeded 4% in two years (6% in 2002, and 5% in 2014).

The Impact of Sequestration on Defense Product Contracts

This section will examine the impact of sequestration, and its aftermath, on DoD contract obligations for products overall, and for those DoD components and product categories that showed notable trends. In order to examine the sources of changes in obligations levels, the study team has done further analysis to examine the specific PSCs and system equipment codes (which identify the program a contract is associated with) which show notable changes in obligations levels from year to year.

Trends in Overall Defense Contract Obligations Under Sequestration

Even in the context of a sharp downturn in defense contract obligations since 2008, the decline in the last two years, as the DoD has had to live under sequestration and its aftermath, has been significant. Overall defense contract obligations have declined by 31% since 2008, from \$409 billion to \$283 billion, but nearly two-thirds of that decline (65%) took place in 2013 and 2014. Overall defense contract obligations declined by 15% in 2013, and fell a further 9% in 2014. The latter decline was particularly notable because of the perception that the decline in 2013 was heavily driven by work being delayed and pushed back into FY2014 in the midst of the uncertainty surrounding sequestration. This perception led many to believe that 2014 would see, if not an increase, then a stabilizing of overall defense contract obligations; instead, 2014 saw another sharp decline.

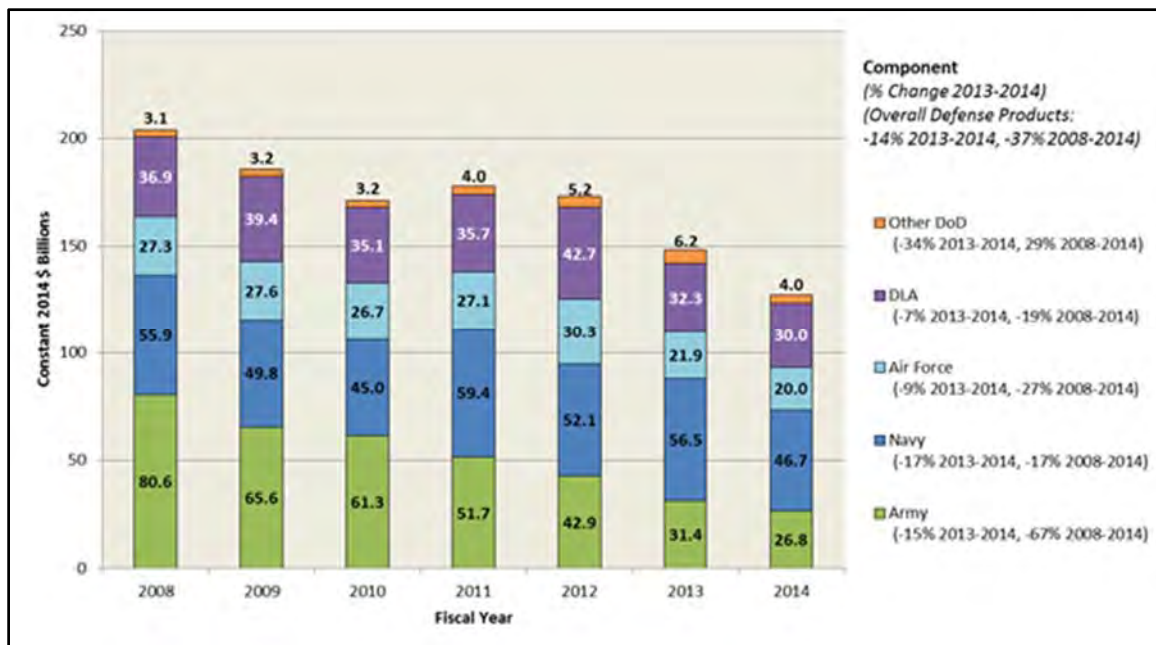
In the FY2013 edition of CSIS' series of reports on DoD contract trends (Berteau et al., 2014), the study team noted that the dramatic decline of overall DoD contract obligations in 2013 was not evenly distributed among the major DoD components: The Army (-21%), Air Force (-22%), and DLA (-23%) all declined more rapidly than did overall DoD contracts,



while the Navy (-2%) and “Other DoD¹¹” (-8%) were relatively spared. Similarly, in 2014, the Army (-14%) declined notably more steeply than did the overall DoD, while “Other DoD” (-5%) declined more slowly than overall, Air Force contract obligations remained steady (0%), and the Navy (-11%) and DLA (-7%) declined at rates comparable to overall DoD.

In 2013, as overall defense contract obligations declined by 15%, defense products contract obligations declined roughly in parallel (-14%). In 2014, as overall defense contract obligations declined by 9%, defense products contract obligations again declined by 14%. Since their peak in 2008, defense products contract obligations have declined by 37%—the declines in 2013 and 2014 have accounted for 60% of that total decline.

Defense Products Contract Obligations Within Major DoD Components (After Sequestration)



Note. Data in this figure comes from the FPDS, CSIS analysis.

Figure 4. Defense Products Contract Obligations by Component, 2008–2014

As with overall DoD contracts, the declines in defense products contract obligations were not evenly distributed among the major DoD components, as seen in Figure 4.

Army

Army products contract obligations, which peaked in 2008, have declined by two-thirds since then.

¹¹ The decline in “Other DoD” cited here is notably lower than was discussed in the aforementioned CSIS report due to the study team’s removal of DeCA data from the sample. This change was made in response to DeCA stopping reporting of most of its contract data into FPDS in 2013. See the Methodology and Data Issues section for further discussion.

In 2013, Army products contract obligations declined by 27%, twice the rate of overall DoD products. There were numerous drivers of this sharp decline, including a nearly \$800 million decline in contract obligations related to the CH-47D helicopter, an over \$1 billion decline related to the Tactical UAV program, a \$1.7 billion decline in obligations for “rotary wing aircraft,” a \$1.3 billion decline in contract obligations for “combat assault and tactical vehicles,” and a \$500 million decline in contract obligations for “land mines.” At the same time, the Army did see significant increases in contract obligations for certain programs and types of products, including a \$900 million increase in contract obligations related to the CH-47F helicopter,¹² a \$1.3 billion increase for the Longbow Apache Block III, largely for “airframe structural components,” and a nearly \$600 million increase in contract obligations for “wheeled trucks and truck tractors.”

In 2014, Army products contract obligations declined by a further 15%, but this decline was roughly in line with the decline in overall DoD products. Significant declines were seen in all three cases noted above that saw significant increases in 2013: the CH-47F helicopter (-\$700 million), Longbow Apache Block III (-\$1.5 billion, to less than \$20 million), and “wheeled trucks and truck tractors” (-\$700 million). These declines were counterbalanced by significant increases in some programs and product types, including \$700 million for the AH-64A Apache and \$1.1 billion for the Scout helicopter program (from \$42 million in 2013).

This analysis shows the significant degree of volatility in contracts for Army rotary aircraft programs, with obligations spiking and dropping off dramatically over the course of just two years.

Navy

Navy products contract obligations have been relatively preserved in the current budgetary downturn—as overall DoD products contract obligations declined by 37% between 2008 and 2014, Navy products only declined by 17%.

In 2013, as overall products contract obligations declined by 14%, Navy products contract obligations actually increased by 9%. The main driver of this increase was a nearly \$8 billion increase related to the F-35 Joint Strike Fighter, but there were numerous other significant increases, including \$2 billion related to the Patriot missile program, nearly \$1 billion for both nuclear reactors and unspecified “combat ships and landing vessels,”¹³ an \$800 million increase related to the CVN-68 aircraft carrier,¹⁴ \$700 million related to the DDG-51 destroyer program, and \$800 million for the H-1 helicopter upgrade program. Navy products also saw programs and types of products with significant declines in 2013,

¹² The concurrent decline in obligations coded as related to the CH-47D and increase in obligations coded as related to the CH-47F may reflect a coding change, rather than a real change in contracting activity. The study team suspects that some CH-47F contract obligations were improperly coded as related to the CH-47D prior to 2013.

¹³ This report uses “unspecified” to refer to contracts that are not associated with a system equipment code in cases where the study team believes that a significant share of the obligations are related to an MDAP.

¹⁴ The study team believes these obligations labeled as related to the older Nimitz-class aircraft carriers, which are coded under the PSC for “Combat Ships & Landing Vessels,” may be mislabeled obligations tied to the newer Ford-class aircraft carrier program.



including a \$3 billion decline related to the P-8 Poseidon aircraft/MMA, a decline of \$2 billion related to the America-class amphibious assault ship, \$1 billion for unspecified “combat assault and tactical vehicles,” and over \$600 million for “miscellaneous vessels.”

In 2014, Navy products contract obligations saw a marked drop after the notable increase in 2013, declining by 17%, slightly more steeply than overall DoD products. Again, the main driver of the year-to-year change was in the F-35 program, which declined by over \$8 billion to below the 2012 obligations level. Other programs and product types also saw significant drops in contract obligations, including a \$700 million decline in the E-2C/E-2D Advanced Hawkeye program, a \$500 million decline for the H-1 helicopter upgrade program, and a \$1.4 billion decline in the LPD-17 amphibious transport dock program. Even with the steep decline, some Navy programs saw significant increases, including a \$600 million increase related to the Ford-class aircraft carrier program and a \$3 billion increase in the SSN-774 Virginia-class submarine program.

Overall, while there has been significant fluctuation in the contract obligations going to individual programs and product types, Navy obligations for products have been relatively steady once the volatility in the F-35 program is accounted for. For the most part, the Navy has been able to preserve funding for its key platforms despite the budgetary constraints imposed by sequestration in 2013 and its aftermath in 2014.

Air Force

Air Force products contract obligations declined somewhat more slowly than did overall DoD products during the current budget downturn—27% for the Air Force between 2008 and 2014, versus 37% for overall DoD products.

Air Force contract obligations were higher in 2012 than they had been since 2007, but declined by 28% between 2012 and 2013, double the rate of overall DoD products. The main driver of the decline was a \$3.4 billion drop in obligations related to the C-17A transport aircraft program,¹⁵ as well as a \$3 billion decline in obligations for unspecified “aircraft, fixed wing.”¹⁶ The most significant increase in Air Force contract obligations in 2013 was a \$900 million increase in contract obligations related to the Shillelagh anti-tank missile, a 1970s Army program. CSIS believes this anomaly is due to the Air Force re-using system equipment codes, which are used in FPDS to tie contract obligations to a particular program. The money associated with the Shillelagh missile in FPDS is otherwise classified as “aircraft, fixed wing,” and CSIS is seeking an updated system-equipment codebook.

In 2014, Air Force products contract obligations declined by only 9%, versus 14% for overall DoD products. Three programs saw particularly significant increases in contract obligations in 2014: obligations related to the C130-J transport aircraft increased by \$900 million, the JASSM cruise missile program saw a \$450 million increase, and the NAVSTAR GPS satellite program saw a \$350 million increase. Three Air Force programs or product

¹⁵ There was also a nearly \$2.3 billion decline in Air Force products contract obligations related to the Evolved Expendable Launch Vehicle (EELV) program, but that decline was due to a coding change, with space launches related to the program being reclassified as a service, rather than a product.

¹⁶ Due to poor data labeling, FPDS shows almost no Air Force contract obligations associated with the F-35 program. The study team believes that the majority of unspecified “aircraft, fixed wing” obligations are related to the F-35 program.

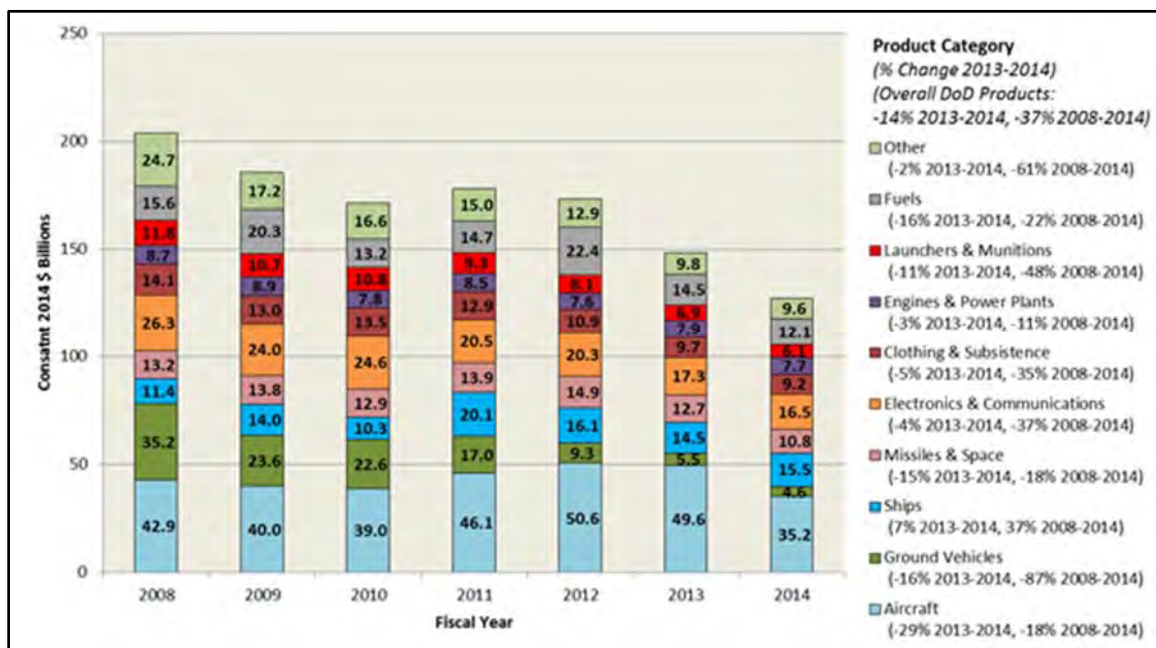


types saw declines of approximately \$400 million each: the AMRAAM missile program, “miscellaneous aircraft accessories and components,” and “electronic countermeasure and quick reaction equipment.” Notably, contract obligations for “airframe structural components” related to the A-10 Warthog close-air support aircraft fell by over \$200 million to just \$13 million in 2014, though this may be due to the timing of contracts, since a similar obligations level was seen in 2012 (after obligations levels near \$200 million in 2010 and 2011).

Overall, the study team is wary of reading too much into the trends beneath the surface of Air Force products contract obligations in recent years, due to the significant data labeling issues. CSIS urges Air Force policy makers to promote greater clarity in the use of system equipment codes among those responsible for entering data into FPDS.

Defense Products Contract Obligations by Type of Product¹⁷

As described in the methodology, CSIS has sorted the range of products for which DoD contracts into 10 categories in order to facilitate analysis of how contracting trends differ across differing types of products. Figure 5 shows how these 10 categories of DoD products have fared during the current budgetary downturn and in the wake of sequestration.



Note. Data in this figure comes from the FPDS, CSIS analysis.

Figure 5. Defense Products Contract Obligations by Product Category, 2008–2014

¹⁷ In order to avoid repetition, the specific dollar changes to programs/specific product types mentioned in the “By Component” section above will not be repeated in this section, except where changes in cross-component totals differ significantly from the changes discussed above.

The following sections will look more deeply into trends for six of these product categories to determine the specific programs and product types that experienced significant changes in obligations levels under sequestration and its aftermath.

Aircraft¹⁸

As overall DoD contract obligations declined by 37% since 2008, contract obligations for Aircraft have fallen at half that rate (-18%).

In 2013, despite the steep drop in overall DoD products under sequestration, contract obligations for Aircraft fell by only 2%, one-seventh the rate of overall DoD. As discussed in the component-specific discussions above, 2013 saw a near-tripling of obligations related to the F-35 Joint Strike Fighter, along with major increases related to the CH-47F helicopter, E-2C/E-2D Advanced Hawkeye, H-1 helicopter upgrade program, and Longbow Apache Block III. There were also sharp declines in obligations related to the C-17A transport aircraft, P-8 Poseidon aircraft/MMA, and Tactical UAV. Additionally, there was an approximately \$800 million decline in obligations relating to the V-22 Osprey across the services, a \$2.9 billion decline in unspecified “aircraft, fixed wing” (primarily in the Air Force, and believed to be mostly unspecified F-35 contracts), and a \$1.7 billion decline in unspecified “aircraft, rotary wing” (primarily in the Army).

In 2014, Aircraft contract obligations (-29%) declined at over twice the rate of overall DoD products, the largest decline of any product category in 2014. This decline was largely driven by the huge drop in F-35 contracts discussed in the Navy section above, which appears to be primarily an issue of contract timing. There were also significant declines in that same pool of Air Force unspecified “aircraft, fixed wing” contracts, as well as with contracts related to the CH-47F helicopter, E-2C/E-2D Advanced Hawkeye, H-1 helicopter upgrade, and Longbow Apache Block III, all of which saw significant increases in 2013. There were, however, some programs that saw significant increases in obligations in 2014, including the AH-64A Apache helicopter, C130-J transport aircraft, and the Army’s Scout helicopter.

Overall, the spike in Navy contracts for F-35s in 2013 obscured significant declines in numerous other Aircraft programs, and many of the other programs that saw significant increases in contract obligations in 2013 declined heavily in 2014. Data labeling is a significant issue in this category, as over \$5.6 billion in contract obligations for rotary and fixed-wing in 2014 aircraft (representing one-seventh of total Aircraft contract obligations) are not properly classified under their parent programs.

Electronics & Communications

Contract obligations for Electronics & Communications (E&C) declined at the same rate (-37%) as overall DoD products between 2008 and 2014.

In 2013, E&C contract obligations (-15%) declined roughly in parallel with overall DoD products. The largest decline was in the unhelpfully vague category of “miscellaneous communications equipment,” which fell by \$700 million. There were also declines of between \$200 and \$300 million in obligations in a variety of product types.

¹⁸ This category includes the only PSC for unmanned systems, called “Drones.” PSCs do not provide any further visibility into what type of unmanned system a particular contract is for; CSIS urges policy makers to break out the catch-all “Drones” code to provide more data granularity.

In 2014, E&C contract obligations fell by only 4%, less than a third of the rate of overall DoD products. No category within E&C saw a change of more than \$250 million.

No particular product type (other than the catch-all “miscellaneous” category) saw a particularly noteworthy change in either year since 2012, though obligations for “electronic countermeasure & quick reaction equipment” have declined by nearly \$700 million since 2012, and obligations for “night vision equipment” have declined by nearly \$400 million in the same period. It is notable that Army contract obligations for E&C have fallen significantly more steeply (-28% in 2013, and -11% in 2014) than for the rest of the DoD. On the whole, however, E&C contracts have weathered sequestration and its aftermath relatively well.

Engines & Power Plants

Between 2008 and 2014, contract obligations for Engines & Power Plants (E&PP; -11%) declined at less than a third of the rate of overall DoD products.

In 2013, as overall DoD products contract obligations declined sharply, obligations for E&PP actually increased by 4%, making E&PP the only category to see an increase under sequestration. Though there was a \$500 million decline in contract obligations for unspecified “gas turbines & jet engines – aircraft,” that was offset by a \$1.1 billion increase in contract obligations for “nuclear reactors.”

Obligations for E&PP continued to be relatively preserved in 2014, declining by only 3%, less than a quarter of the rate of overall DoD products. There was a nearly \$500 million increase in E&PP contract obligations related to the F-35 program, which is somewhat interesting because of how it lagged the spike in obligations for the actual planes in 2013. The study team believes that E&PP obligations related to the F-35 have only in 2014 started to be properly labeled as such, as F-35 obligations never exceeded \$100 million prior to 2014.

Overall, E&PP contract obligations have been remarkably stable during sequestration and its aftermath, which is likely a function of how major E&PP contracts are tied to large, prominent platforms that previous CSIS analysis found were largely protected under sequestration (Berteau et al., 2014).

Ground Vehicles

Between 2008 and 2014, contract obligations for Ground Vehicles declined by a remarkable 87%. Even accounting for the fact that 2008 represented a nearly 50% spike in obligations (related to MRAP purchases) compared to 2007 and 2009, obligations have dropped by around 80% from 2007 and 2009 levels.

In 2013, contract obligations for ground vehicles declined by 41%, the largest fall for any product category under sequestration. The major drivers of this decline were a \$1.8 billion decline in unspecified obligations for “combat assault & tactical vehicles” (primarily within the Marines), a \$500 million decline in obligations for unspecified “combat assault & tactical vehicles – wheeled” (primarily within the Army), and a \$400 million decline in obligations related to the Bradley Fighting Vehicle.

In 2014, by contrast, Ground Vehicles contract obligations (-16%) only declined slightly faster than did overall DoD products. The Army saw further reductions in obligations for unspecified “combat assault and tactical vehicles – wheeled” (-\$400 million), while obligations for “trucks and truck tractors – wheeled” fell by \$700 million. Obligations for unspecified “combat assault & tactical vehicles” increased by nearly \$500 million, but whereas the large decline for this product type in 2013 was for the Marines, the increase was primarily in the Army.



DoD contract obligations for Ground Vehicles have cratered since their peak in 2008, and are lower in 2014 than they have been since 1999, right as the Army was beginning its ill-fated Future Combat Systems program that was intended to provide replacements for its aging fleet of ground vehicles. The inability of the Army since then to get a new ground vehicle program into full production, as well as the end of major combat operations in Iraq and Afghanistan, are the main drivers of this precipitous decline.

Missiles & Space

Contract obligations for Missiles & Space (M&S) declined by 18% between 2008 and 2014, less than half the rate of overall DoD products.

In both 2013 and 2014, contract obligations for M&S declined by 15%, roughly in parallel with the decline in overall DoD products. The decline in 2013 was almost entirely the result of a data coding change: \$2.3 billion in obligations for space launches under the EELV program were reclassified as services rather than products. By contrast, 2014 saw what appear to be real, significant changes: a \$2 billion decline in obligations for MDA Support for “guided missiles,” a \$400 million decline related to the AMRAAM missile program, and notable increases in obligations related to the JASSM cruise missile program and the NAVSTAR GPS satellite program.

Ships

During the 2008–2014 budget downturn, as overall DoD products contract obligations declined by 37%, obligations for Ships actually increased by 37%, making Ships the only category to see an increase over this period.

In 2013, contract obligations for Ships declined by 10%, somewhat more slowly than for overall DoD products. As discussed in the Navy section earlier, there were notable increases in obligations related to the CVN-68 aircraft carrier, DDG-51 destroyer, and unspecified “combat ships and landing vessels,” along with significant declines in obligations related to the Ford-class aircraft carrier and the America-class amphibious assault ship.

As overall DoD products contract obligations declined by 14% in 2014, contract obligations for Ships actually increased by 7%; Ships was the only product category to see an increase in obligations in the year after sequestration. Obligations related to the Ford-class aircraft carrier and the SSN-74 Virginia-class submarine both nearly doubled in 2014.

The relative preservation of contract obligations for Ships in 2013, and the growth in 2014, is likely the result of a new policy development and a couple of existing factors. First, the “rebalance to the Asia-Pacific” has put a focus on the importance of sea platforms to future U.S. strategic interests and goals. Secondly, many of the major Ships programs are long-term production contracts, and a number are under multi-year procurement agreements; cutting or delaying funding for these programs would likely lead to greater costs over the long term.

Final Thoughts

This report presents only a fraction of the data compiled for this study; the final report coming out of this research effort will examine a broader set of contract characteristics, go into greater depth on some of the trends identified here, and focus more deeply on the non-MDAP-centric product categories. This report represents what the study team believes to be among the most notable and immediately relevant findings. The following are the key takeaways from this analysis:

- The overall rate of effective competition for products seems to have been largely unaffected both by the post–Cold War drawdown of the 1990s and the



current drawdown plus sequestration. There is a logic to the assumption that rates of competition would increase as the same pool of vendors fought for a declining pool of contract dollars, but that assumption has not been borne out in the data. By contrast, there have been notable declines in competition rates for MDAP-heavy product categories, such as Aircraft and Missiles & Space, particularly in the years after the Last Supper industry consolidation.

- The current downturn has seen the relative preservation of contract obligations going to the Big 6 defense vendors, despite the divestment of Northrop Grumman's large shipbuilding unit into Huntington Ingalls Industries. This is likely a reflection of the preservation of the largest, most high-profile programs as budgets declined; these programs are disproportionately contracted to the Big 6.
- Sequestration has had an enormous impact on defense products contracting, even in the context of the overall decline since the peak in 2008. Overall defense products contract obligations have declined by 37% since 2008, but three-fifths of that decline occurred in just 2013 and 2014.
- Cuts in obligations were not evenly distributed among the major DoD components and product categories in 2013 and 2014. Many of the components and product categories that saw the most significant declines in 2013 were relatively preserved in 2014, and vice versa. This also applies to specific programs—many programs that saw major increases or cuts in obligations in 2013 saw significant reversals in 2014.

Data quality, both in current data and the pre-2000 data, remains a significant barrier to some areas of analysis. The major outstanding data quality issues include the following:

- The grouping of all unmanned systems contracts into a single PSC for "Drones" does not provide sufficient data granularity for an increasingly important segment of the DoD products portfolio.
- Data labeling issues within the Air Force, which show almost no obligations associated with the F-35 and the reuse of old codes for new projects, as shown by nearly \$1.5 billion associated with a 1970s Army anti-tank missile program, are reason for concern and skepticism about the reliability of the valuable system equipment code field.
- The huge amount of contracts apparently either missing from or significantly undervalued in FPDS between 1990 and 1994 are a significant bar to any analysis trying to use FPDS data to examine the previous budget drawdown of the 1990s; this is a vexing issue that negatively impacts the researcher's ability to distill out policy recommendations for policy makers.

Going forward, the study team will continue to work to find solutions to existing data quality issues, and to highlight those issues to policy makers where solutions are not possible on our end. CSIS will also continue to dig deeper into the wide range of data available on contract and vendor characteristics in the DoD products contracting market to identify key trends and possible lessons learned.

References

Berteau, D., Ellman, J., McCormick, R., & Sanders, G. (2014). *U.S. Department of Defense contract spending and the industrial base, 2000–2013*. Retrieved from <http://csis.org/publication/us-department-defense-contract-spending-and-industrial-base-2000-2013>



Ellman, J. (2014). *Quality of competition for defense contracts under “Better Buying Power.”*
Retrieved from <http://csis.org/publication/quality-competition-defense-contracts-under-better-buying-power>

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